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Main Currents IN MODERN THOUGHT

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MAIN CURRENTS in Modern Thought Announcement

With this issue MAIN CURRENTS in Modern Thought begins a series of planned changes looking to greatly enlarged usefulness, which will be put into effect month by month. Such changes at this time are warranted by the growth shown in our first eighteen months of existence. Commencing with this issue the post of Managing Editor is assumed by Miss Grace Tabor, whose many years of experience as garden editor of a national magazine, and whose knowledge of biology will benefit our enterprise extensively. Miss Tabor has for some time done source reading for us in biology journals. Our readers are already aware of the growing body of data documenting the biotic nature of the cosmos.

There has never been so crucial a moment in the stream of thought as now. External events are not all which move at a tremendous pace. Concepts tending to co-ordination of all branches of knowledge are coming forward constantly. Some of these are notions common enough in Platonic times and before, getting new documentation through modern techniques in mathematics, many-valued logic and the like. Others are what seem to be entirely new ideas which appear as by-products of revolutionizing discoveries. One such is the mist-like electronic constitution of matter; another, the connection of crystals with the life process, by a dozen different developments in two or three branches of knowledge.

We keep constantly before us that MAIN CURRENTS recognizes: 1. That Nature is one, and therefore meaningful investigation and experience must reveal the unity of the whole and cannot be of any other or greater significance; 2. That the whole field of knowledge and experience has to be kept under constant survey to capture from the torrent of contemporary data, that occasional item having sufficient basic meaning to reach into every one of the great disciplines -- science, art, religion, and philosophy; 3. That the urgent and obvious importance of social issues today, the fact of the abatement of political slavery, and the rise of technology and mass production entitles economics to special attention and an entirely fresh treatment as a dynamic science of stewardship, responsible to the whole community; 4. That the present disintegrated state of the human mind, the vast unrelated accumulation of fact, the cynicism and doubt about historical religion and the anti-social uses of material science underlie our social disorder -- our mental and psychological sickness.

Among these items which govern our policy, the third above now bears upon us so urgently that it becomes our duty to develop the most specific notions we can in these pages. The Commission to Study the Organisation of Peace, 8 West 40th St., New York City, which has published two reports on its work, (the current one is noticed in our Social Man department herewith), has announced the issuance of a study of the United Nations and its possibilities, and says further: "Other Studies are now in progress, particularly for the difficult field of economic reconstruction." The work of the Guild of American Economists, a research body, is also reaching an interesting stage. The latter is governed by philosophical considerations that are deep and wide and far-reaching---and in some particulars novel and striking. This group is the first known to us that is making a systematic attempt to base economic studies upon a union of natural and moral law.

Among the backlog of documents which the increasing tempo of research and events has built up in the files of MAIN CURRENTS there is a world of fascinating material waiting to be published. A unique geometrical treatment of the Special Theory of Relativity, by Dr. Archibald Henderson, is one example which falls under item two of the above. This is a paper which puts the theme of that remarkable event in thought, in such a manner that it can at last be looked at.

This sort of thing is surely too important to be lost sight of. Thus MAIN CURRENTS is adjusting its growth to the needs of the philosopher of the day -- and we assure our readers it will take whatever form is necessary to keep up with the demands made upon it. The principles which have distinguished it physically will continue in effect. The loose-leaf make-up and the department-color guide will be unchanged. During the months immediately ahead, in which the issues of the second half of the present volume run their course, ways of improving the format immeasurably will be put into effect; while efforts to enlarge our coverage of sources are continuous.

Much depends and will always depend, upon our source-reading help. Will our collaborators kindly respond to our growth and increasing needs by interesting friends and more friends in the reading of journals ? It is not exaggeration to say there is practically no limit to the readers we would like to have -- and confidently look forward to having. Write to us about it ! Write to us about subscribers too, and special gift subscriptions among your acquaintances in colleges, high schools, libraries; among editors and teachers and folks in general. F. K.

PHILOSOPHY AND THIS CRISIS Extracts

"There is widespread confusion among people today relative to the basic things of life. I realize that man is always confused and that there never was a golden age, when all men, or even most men, saw crystal clear. It is surprising, however, that there are today so many educated people who do not see totalitarianism as a threat to the democratic way of life. This confused state of mind can lead to a searching for truth for a more clearly conceived philosophy of life. We ought to be thinking a lot about this confusion, this perplexed state of mind. Sometimes it is associated with an attitude that is searching for truth; other times it is associated with an attitude of lost faith in old beliefs. It is serious....."

"We are living in an era of rapid cultural change. We are passing from a pre-scientific culture to culture dominated by science and technology. The velocity and scope of this change are terrific. In proportion, it is just as great as when we asked the Sioux Indians to adjust from buffalo and tepees to plows and drills and homes made of lumber. Something went hay wire in college and university education about a generation ago, and it has been that way ever since. Philosophy, which is the discipline of all disciplines, and which can help people to think clearly, began to lose out. To be perfectly frank about it, it doesn't cut much figure as a discipline in the educational system today. A couple of years ago I was on the campus of a midwestern university. I asked how many students there were and learned that there were 14,000. How many students are there in the philosophy department ? Answer: Around 150. Who takes philosophy ? Answer: Mostly students in the College of Education. Is it a vital department ? Answer: I don't know; you don't hear much about it....."

"Religion as a college discipline is in even worse state. By and large, as far as the college curriculum is concerned, it is close to non-existence. As for the colleges, they have very little to offer in college courses on the nature, history and function of religion -- what it is, how it motivates men.....From the standpoint of the sciences, the situation is different, but not much better. The

colleges are doing a splendid job of teaching science as a basis for research and as a basis for technology, but again, the philosophical side of science is practically ignored. Such questions as "What is science ?" "What is scientific method?" "What is its history, its place in man's culture ?"and "What are its limits ?" do not get much consideration."

"I want to close with the thought that some way or somehow philosophy and religion must rapidly climb to a more dominant place in our culture. I think that there are great masses of educated people in this country who, in their college courses in the last half century, were deprived of contacts with the philosophical and religious disciplines. They have not been greatly concerned with what these disciplines have to offer, but they are perplexed now about the problem of values and they are anxious to hear what these disciplines have to say. On this assumption we tried out in the Department of Agriculture, a few years ago, a plan of having schools of philosophy for employees of the Department, and for field workers of the Department and of the Co-Operative Agricultural Extension Service. These schools of philosophy have usually lasted about five days, about half of the time of the schools being given over largely to lectures and discussions by competent philosophers from the colleges, with particular reference to what philosophy has to say about democracy, about the problem of values, and the relation of the individual to society. These schools have been very popular, and those who have attended them have wanted more. They have convinced me of two things - first, that it is possible and desirable for government to carry on a type of in-service training program for government employees about what democracy is and how it can be related to the administrative process; and, second, that there is a genuine hunger on the part of great masses of people for a better understanding of democracy and of the democratic way of life." (M. L. Wilson, U. S. Dept. Agriculture, in Second Symposium of Science, Philosophy and Religion, New York, 1941, pp. 509-510, & p. 516.)

SCIENCE IN MUSIC Abstract

In the light of prevailing musical theory and practice, music draws upon a number of basic sciences such as mathematics, physics, physiology, anatomy, genetics, anthropology and general psychology. It has become the function of the "psychology of music" to integrate all these contributions. The initiative has been taken by psychologists, but as knowledge of the scientific aspects becomes a part of artistic creation and skill, this work of integration will be taken over more and more by musicians and the distinction between the scientist and the artist will tend to disappear. According to Prof. Carl E. Seashore of the University of Iowa, psychology has paved the way and the following twelve statements show in part, what psychology has done for music.

1. Psychology gives us a workable insight into the nature of the musical mind and thus lays foundations for the classification of events in musical experience and behavior and for the development of a scientific musical terminology. 2. It organizes the scientific description of musical tones and the means for producing them. 3. It gives us an orderly insight into the nature, scope and limitations of musical hearing and appreciation. 4. It enables us to analyze and evaluate musical talents as a basis for guidance in musical education, vocational and advocational. 5. It furnishes the technique for the measurement of musical achievement by the analysis and objectifying of goals as a means of motivation in training. 6. It enables us to organize musical training in terms of a growing body of principles in educational psychology. 7. It paves the way at all levels for the principles of musical criticism and a logical award of praise and blame. 8. It makes possible the use of performance scores for the detailed analysis and quantifying of artistic elements in musical performance. (Musical phono-photography). 9. It enables us to set up prevailing norms of prevailing musical achievement and to show by experi-

ment how these norms for attainment could and should be refined. 10. It furnishes instruments and techniques which will shorten the time of musical training and yield a higher precision and mastery, than is ordinarily attained. 11. It enables us to record, preserve and interpret music in all forms of historical interest. 12. It furnishes the groundwork for a future science and philosophy of musical esthetics. What is here indicated for music applies in principle to all the other fine arts such as language, drama, poetry and dance. (Science 95, 417-22, April 24, 1942. A. J. P.)

MUSICAL BEAUTY Abstract

Evidence that what we treasure as beautiful or good in music is decided by something more than irrational whim or prejudice, was cited by Dr. Carrol P. Pratt of Rutgers Univ., before the Second Congress for Aesthetics in Washington, D. C. Such qualities as stateliness, melancholy, wistfulness, gaiety and agitation have been found experimentally to be intrinsic properties of the tone patterns themselves, not fanciful projections on the part of the listener. If he has ears to hear, the basic musical qualities are still there in the sounds themselves, just as pitch and loudness are there. (Science News Letter 41, 277, May 2, 1942. A. J. P.)

CURRENT DEFENSE OF VALUES Book Review

Harcourt, Brace and Company have issued the second volume in their Science of Culture Series, the first having been Freedom; Its Meaning, in 1940. The present volume is devoted to Science and Man, and is edited by Ruth Nanda Anshen. The contributors continue to be first-rank names, the present volume starting with Ales Hrdlicka and ending with Ralph Barton Perry---from the Smithsonian to Harvard, from Anthropology to Philosophy. The whole is held together by a continuing thread of interest in values. Dr. Perry's item is in fact entitled "The Science of Value and the Value of Science". "This book," as the editor puts it, "is an apostrophe to value." It contains however very little that is new, and displays the standard weakness of all works of this sort on this theme. That is, there is no progress from one landmark to another, no integration of knowledge to show where knowledge ends and where those terminating roads tend to direct us. There is very little reference to the revolution of our time, which has swept away matter and tends to put symmetry and harmony in its place. Now and then some considerable gain in thought is indirectly developed, as by Reinhold Niebuhr (p. 55), when he refers to the old Hindu triumph of analysis of man into a higher and lower self---pursuing, of course, western thought alone about this: "The real situation is that Man does transcend nature but he also transcends himself." This Dr. Niebuhr puts in italics.

The most significant and subtle paper is by the French Catholic philosopher, and apostle of Thomism, Jacques Maritain, on Science and Wisdom. As is appropriate to such thinkers, the chief concern of Dr. Maritain is to put mathematics in its proper place, subordinate to metaphysics, and that latter no higher than theology. It is extremely interesting to see the headway being made by mediaevalism under the skilled guidance of this extraordinary man. Anyone interested in main currents in modern thought must take cognisance of this growing group of men, such as Mortimer Adler, another convert, who have unparallelled intellectual power but start out with assumptions about the Incarnation and about Deism which may not at all be brought under direct scrutiny when they speak or write, but are defended by a form of reasoning so subtle and so well informed as to leave the reader, not equally well informed, quite persuaded to beliefs which---if they were put to him frontally---he might not at all incline to assent to. We recommend this article, especially the notices of mathematics: "Pythagoras attempted to build up the realm of wisdom it-

self into the radiance of mathematical knowledge. Yet Plato willed that geometry be only the threshold of wisdom." In modern times, "Mathematics has devoured every trace of philosophy that remained in the structure of science." The same sort of faint praise goes to Indian thought. "India always conceived of wisdom as a wisdom of deliverance and salvation."....."But this wisdom of salvation, India did not learn from the prophets and the Messiah of the people of God." There is even a reference to "the rush of crowd throwing themselves beneath the car of Juggernaut," very skillfully introduced, in a way that rouses incidentally all the prejudice people have felt about India. Nirvana is taken to be negation, and so on. This is rather misleading. Indian thinkers are of course quite aware of the relation of metaphysics to theology, and put them in their proper relation especially Shankara.

Dr. Maritain's difficulty arises from his ignorance we must suppose of the properties of space-time. Today we find available extensive knowledge of the mathematics of order provided by modern pure inquiry. This is supported in turn by natural science. To this Dr. Maritain makes no reference. The cure for this situation is to be found in a wider dissemination of knowledge about the properties of Riemannian elliptical geometry, its identity with the fourth dimension, the goverance of events in time by those properties, the different ranges of those properties displayed by various kinds of time-events, such as ordered motion in growth, and so on. Instead then of having important spiritual principles which we must all gladly admit ---the reality of Deity, the reality of the Incarnation--- put forward on specious grounds and accompanied by ill-informed remarks about Hinduism and Buddhism, we shall have the whole established upon a basis so universal and solid that the event we all look for shall come about; namely, spiritual re-direction of human life. F.K.

SCIENCE AND MAN, Vol, II in the Science of Culture Series, edited by Ruth Nanda Anshen, Harcourt Brace and Co., New York, 1942, 494 pages.

BRAGDON AT HIS BEST

Book Notice

The present volume, Claude Bragdon's latest, provides at a mature moment in his eventful life a representative slice of a diversified mind. Bragdon, as we all know, belongs to that rare and important class of artists who are as articulate in the medium of writing as they are lucid in some mode of art of forms. Such men have also more than enough intellectual power to cope with the meaning in their own and other people's experiences, and thus are philosophers, not just arid critics. Leonardo da Vinci is the conspicuous prototype in a domain that is large even though it contains a small number of enduring names. We sometimes forget that Ruskin belonged here. One often wonders what Ruskin would have been had he had, like Mr. Bragdon, the advantage of acquaintance with the clues to the whole business of living in beauty---what is called sometimes the esoteric tradition, if we may use what Mr. Bragdon himself somewhere properly called a hateful word. At any rate our present author has had the key for many years, and that I suppose is the final reason why, when he writes of The Fourth Dimension, The Androgyne, Preparedness for Peace, Yoga and Skyscrapers as he does among these eighteen solid essays, he is not just all over the place, but is a light sending out rays from a central hypersolid - a shining, world-awakened soul. Those who know him already will be happy to have this certainty-giving volume. For those to whom he is going to be a discovery it is a very good place to begin. F. K.

THE ARCH LECTURES, Claude Bragdon, Creative Age Press, New York, 1942, 239 pages, $2.00.

It is extremely premature to try to decide what is the final nature of that cosmic unity which maintains the supremacy of order under the veil of external events. It may appear relatively easy to do this if we attend only to physical science findings, and many such incomplete monisms apparently possess some of the highest minds in the physical sciences. But when the life process, and especially when man is faced fairly then the final nature of the unity involves so very much and discloses so great an unknown, that opinion has to be extremely tentative. It would not need to be so guarded at it commonly is, if only the necessary co-ordination of data from all departments of inquiry were available. But the number of people who really know the indisputable facts and laws of the several sciences, as well as the highly probable facts and likely laws, and who also know what it means to possess artistic creative powers and have deep religious experience---this number is not only relatively but absolutely small. We usually think, the number is naturally small because life is too short for anyone to find out all this. And we assume no one could have found out anyway because the only kind of valid knowledge is scientific knowledge, and science is too recent an event in history.

But that, of course, is not the real reason why the number is small. The real reason is that when we look to science alone, or even admit that the final validation for what is found out by some other method can come from science alone, we prejudge the issue. The majesty and total worth of scientific gains are admitted on all sides. Its usefulness in settling the final nature of the cosmic unity and order is, and will continue to be, very high indeed. But only a very little thought will show that it is only a part of a greater whole. Suppose we ask ourselves what is going on when a fugue or a symphony is being written ? We have to say we don't know, really. Creative art is at work, we say: that is only a phrase to label something or other. But when we apply scientific methods to the product we experience a rather surprising discovery. The composition is a most complex series of equations devised by Legendre and others, and now summarised under the heading, in mathematics, spherical harmonics. This is the form of mathematics which enables us to discuss in one topic the flow of heat, the action of electricity and musical compositions. We say nothing here of the value of music. Let us suppose that music has no value. Let us only ask ourselves what is going on in Bach or Beethoven that the product should be what it is ? If values are put aside---and science has no concern with values, and should not have, though scientists as social beings had better have !---we still have a phenomenon to explain. Is Bach just heat conduction ? Is Beethoven only a stroke of lightning ?

This illustrates the basic trouble. There are several cures for it, but they all involve raising the importance of philosophy in educational esteem, and this in turn involves facing the importance of a completely integrated education. By completely we mean exactly that. Take, for example, the matter of acquainting an American student with the concepts of Hinduism or of Buddhism. He would find that mystical experience is not a form of hysteria or of schizophrenia. He would find that Christianity would not stand so isolated as it does by reason of the peculiarity it arrogates to itself. He would find that remarkable notions about cosmic unity are available to strengthen those which he gets elsewhere. He would find that ideas about evolution have long been known, and known as part of religion, not as concepts alien or inimical to religion. Would this not benefit him ? It only strengthens our faith in science if we find that some sort of intuition about its higher findings (such as evolution) is at work, as musical form is at work, in some men; and that this intuition arrives at these conclusions by a method which preserves worths and values in a way science does not, can not and should not.

To achieve, then, useful preliminary notions about the final nature of the cosmic unity we have to bring to attention all the laws really established in biology, in

psychology and in the physical sciences, as well as all the great concepts among philosophers. We have to consider the ideas which have attracted humanity in all religions, and some knowledge and experience of the basics in the arts, in mathematics, in language. This, of course, is the business of MAIN CURRENTS. Out of this background, established as best we can establish it in anticipation of universal concern with it by the universities, we assemble the current materials of authority and general interest.

Unfortunately in education the tendency is not toward this universality as a whole. (There are occasional exceptions, as we noticed last month in a review of a new history college text). In Science News Letter, April 25, 1942, for instance we are told that biology is losing ground in high schools. Yet here is the subject which is most desperately needed as a central feature of the concept of final cosmic unity. Dr. Oscar Riddle of the Carnegie Institute of Washington says it has lost ground during the last ten years as a high school subject for general knowledge or the stimulation of thought. He was working from 3000 replies from about 16,000 teachers in secondary schools. He found there is a definite tendency to avoid difficulties with group prejudices by omitting or "playing down" controversial subjects. About 14% of the public schools and even more of the parochial high schools do not discuss the subject of inborn inequalities in human beings, and a full half of all schools from which replies were received avoid the teaching of evolution as a part of their biological studies. There is a widespread tendency to teach biology not as a science but (a) as a way to pleasing hobbies, or (b) as a series of practical technologies.

Let us look at the issue from another angle, the astromer's. Why is biology so important for a basic concept of cosmic unity if the universe is mainly matter ? For one thing, life shows no signs of conforming to physical science notions of a fatalistic kind. (F. H. Pike of Columbia University has a valuable discussion, The Improbability of Determinism in Biology, in Anat. Rec., 81, 4, suppl. 115, 1941. He also discussed previously the thermodynamic probability rules of living organisms in Anat. Rec., 81, 4, supplement 114, 1941). If there is anything in the universe which is free of determinism then the final concept of the universe has to incorporate that element of freedom. Furthermore, we find increasingly in physics the tendency to detect principles of polarity in the stellar universe. And polarity is a conspicuous property of life. An item illustrating this point appears in Physical Review, 61, pp. 489-503, April, 1942. It was discussed also in The New York Herald Tribune by its able science editor, John J. O'Neill, May 10, 1942. The digest is in the following paragraph.

From a utilization of the 18 inch Schmidt telescopic camera on Palomar Mountain, and a review of the known observational facts, Dr. Fritz Zwicky of the Calif. Inst. of Tech., reached conclusions which favor the assumption of a balanced rather than an expanding or progressively exploding universe. It has been found that the nebulae far out toward the boundaries of known space are more extensive than earlier photographs revealed. Recent discoveries have shown fragments of our universe near the northern and southern galactic poles, far beyond the spherical cloud of stars known as the milky way. These new components give our universe an unfamiliar shape. It is no longer like a thin whirling disc but more like an elongated spindle with a pinwheel in the middle enclosed in a transparent sphere. Dr. Zwicky has found that there is at least twice as much matter in the star populations of the nebulae as had been previously calculated. This upsets distance calculations and throws into doubt the reality of the red shift of light which has led to the theory that the stars are speeding away from us in all directions. Thus the observed large scale distribution of matter in space and in velocities, exhibits the degree of uniformity which permits the assumption of a stationary universe. The observed radial distribution in clusters of nebulae has not been accounted for on the hypothesis of an

expanding universe. And the observed second order effects in the red shift of light from nebulae, so far favors the assumption of a stationary universe, or at least one of equilibrium.

This is a step forward in unifying the stellar cosmos by applying the same balance of attractive and repulsive forces to heavenly bodies as attributed to atoms, a system made familiar from the treatment by Karl Darrow of Forces and Atoms, in the Bell System Technical Journal, 20, 340, 1941. The problem of unifying cosmic and atomic theories engages the most advanced mathematical physicists under Einstein at the Institute of Advanced Studies in Princeton. Polarity is not only a feature of electricity, but of biology, and if instead of tearing the vital heart out of biology and saying cellular goings on are only electrical activity---which explains very little---we reversed the process and considered whether perhaps there is not a biological, even if superphysical, side to the universe, we would be on safer ground. This amounts to saying that material or stellar features are only the same sort of abstract of a larger total process, the biotic cosmos physical and superphysical, as the explainers of animals make when they say an animal is just electricity. Plato still stands secure when he says in the Timaeus the universe is a great animal. The suggestion is not that it is a dog or a cat or even a man, but that it have affinities with the cell, at least.

Extracts from a stimulating address by Dr. R. W. Gerard, Professor of Physiology, University of Chicago, at the University's Fiftieth Anniversay celebration, on the evolution of transmissive mechanisms between cells in the organism and between organisms in the social system, are pertinent. It will be found complete in Biological Symposia, Vol. 8, and in part in Science, March 27, 1942. The following phrases caught up out of a closely reasoned and convincing discussion of a biological society gives a good idea of the importance of biotic thought in contemporary society, especially during the current crisis. We quote Dr. Gerard's final paragraph verbatim, for it shows how important biological concepts are in determining, even tentatively, the final nature of the cosmic unity.

"Protoplasm subjected to an adequate stimulus enters a new state....response is not restricted to the stimulated region....Some form of excitation must be communicated from the originally excited region to neighboring ones; and this is the essence of transmission....Evolution exhibits striking directional changes in the transmission capacities of organisms....In speed...in distance...or in pattern. The nervous system adjusts an animal to its environment, the environment, reciprocally, has fostered the development of the nervous system....A higher organism, then, has advanced beyond a lower one in its ability to respond to more kinds and gradations of environmental change with behavior which is more rapid, complex, variable, integrated and especially adaptive.....The automatic segmental portion /of the nervous system/ is dedicated to self preservation...it is the selfish part of the psyche. Cerebral awareness is more abstract and represents the reasoning, valuing, aspiring part of consciousness. It is the social part of the psyche...It is important that supersegmental function is gaining still over segmental function...and with this must come a relative increase of altruism over selfishness with continued biological or social evolution...with evolutionary advance there is progressive emphasis on cooperation of unlike units relative to competition between like ones.

A unit system composed of lesser units in some degree of interrelation....has been called an org....an org at one level may, in turn, be a unit in an org of higher level...molecules in cells, cells in multicellular organisms. Multicellular organisms are built into higher level animorgs, which may be called epiorganisms. The mammalian family and herd and ultimately the larger human social groups constitute various epiorganisms....such groups of organisms form a true unit, albeit often a poorly integrated one.....In the evolving epiorganism...the speed and distance of effective transmission steadily increases....the driving evolutionary factor in the

case of the epiorganism, as of the organism, is the stimulative action upon it of its environment....It is objected that coherence of the social group depends largely in animate materials....but our own outer skin and nails and hair, most of our bone and cartilage....are all completely dead. They have been built or accumulated by the action of living cells, but are not themselves alive, and in many cases never were. In the same way, not solitary but social man has introduced as new structural materials in the body of his epiorganism such substances as cement, rubber, plastics and metals.

Man then is an org, an individual organism and he is part of an org, a unit in an epiorganism....Societies evolve into more integrated orgs and the parts, down to individual man, become more subordinated to the larger group....our federal government is inevitably growing, relative to state governments...an effective international will supplement and eventually largely supplant our present national ones. Isolationism is a biological anachronism. The individual is also changing under the influence of the epiorganism in which he develops....The most significant of these gradual changes....is the progressive growth of altruism....loyalty toward and service or sacrifice in behalf of the group, trade or professional organization, religious body and particularly the whole state....is marked and increasing. Human nature is evolving but is doing so less rapidly than is the epiorganism in which it expresses itself. Altruism is not generalized to the full group, to the whole human epiorganism, but only to the larger subordinate groups based on race, religion or state.---Perhaps other wars on a still greater scale are to be encountered on the path to world integration....but ultimately this integration must be achieved."

"The new brain, the cerebral cortex, is evolving continuously and greatly under the influence of education, which profits by cummulative social achievement; the world is ever more at our individual doors, and cooperation is being generalized to larger and larger groups; mankind as a whole will become an integrated cooperative unit; and the ultimate future of human society, however dark it may look to the contemporary sociologist or even to the historian, appears in the eyes of the biologist, sighting down the long perspective of organic evolution, as bright with hope."

But of all the items which make current biology essential to the philosopher, that which follows is the most critical in months. It shows that some of the properties of life reside in molecules ! The item is abstracted from an article by Max A. Lauffer, writing in Rept. New England Assoc. Chem. Teachers. 43, (1) 4-12 (1942) thru Chem. Abstracts 36, 1341 (1942).

Through the study of tobacco-mosaic virus it has been demonstrated that viruses are protein particles and that these particles are homogeneous chemically and identical in one dimension. It was not possible to obtain preparations in which the rod-like particles were all of the same length. But the spherical particles of bushy-stunt virus protein were shown to be of identical size and shape; this indicates that viruses are molecules. Thus, we have molecules which resemble living things in at least superficial respects. F. K. and A. J. P.

PLANT CANCER Biology Item

Cancer spreads in plants much as it does in animals, Dr. Philip R. White of the Rockefeller Institute, told the American Philosophical Society. Dr. White has demonstrated that cancers of plants, called crown galls, can be transplanted or occur naturally without the aid of the germ that caused the primary growth. For more than a year, tissues from the secondary tumors, which are bacteria free, have been grown outside the plant in vitro. Grafted into either sunflower or artichoke plants, they produce typical crown gall tumors. (Science News Letter 41, 275, May 2, 1942. A. J. P.)

THERMOPERIODISM IN PLANTS — Daily Cycle

That plants need the daily rise and fall in temperature as well as the daily changes between daylight and dark to produce fruits and seeds, has been demonstrated by Prof. Fritz Wendt of the California Institute of Technology. Working with tomatoes, plants kept day and night at the optimum temperature of 26°C grew and blossomed, but failed to set fruit. In other experiments, tropical plants like orchids responded in the same way to daily fluctuations in temperature. It is believed that the temperature changes are linked with internal physiological changes connected with the formation and translocation of food substances. (Science Supplement 95, 10, May 1, 1942. A. J. P.)

IS NATURALISM UNNATURAL ? — A Note of Caution

The Society of Public Analysts and Other Analytic Chemists, and the Food Group of the Society of Chemical Industry held a conference at Burlington House, London, December 3, 1941, on the Fortification of Human Foods by the Addition of Specific Nutrients, reported in Nature, December 20, 1941, pp. 760-762. The first paper was by A. L. Bacharach, who "attacked the naturalist school".....who "would apparently condemn the fortification of flour with synthetic aneurin, but would applaud the same fortification if made with vitamin B1, laboriously isolated from yeast." (He himself said "ascorbic acid cannot wholly replace orange juice" and the fortification of bread with calcium was admitted in the conference to present technical difficulties). When is it going to be conceded by men in all walks of science that there is a subtle element in biological process that simply cannot be captured for sure in synthetics, even though the chemical formula appears to be the same, and is, in a gross sense ? For industrial processes synthetics are all very well, but when it comes to feeding living creatures with products of life we have to be deeply concerned with naturalism for a long time to come. Recently we made reference to known strong vegetable poisons of Africa which were put through an American University laboratory but showed only tannic acid. Ordinary organic chemistry is as yet dealing with life only in a crude way. If one atom is changed, chlorophyl becomes haemoglobin. These may be processes of growth where one atom not in a hundred but in five or fifty thousand makes a vast difference in ways beyond detection. On grounds of philosophy, naturalism has a large place.

NIGHT VISION AND DAY VISION — Human Psychophysical Items

Differences between the eye as a night vision instrument and the daylight eye, important for night warfare and blackouts, were described by Prof. Selig Hecht of the Laboratory of Biophysics of Columbia University, at a meeting of the Physical Society of Pittsburgh. Night eyes are thousands of times more sensitive than day eyes. The night pilot who has been flying in the dark for an hour or more can see the light of a candle twelve miles away even if exposed for only a thousandth of a second. For this reason it is dangerous to use a flashlight, light a match or even a cigarette during a blackout. Night eyes can not see as sharply as day eyes. For the recognition of small forms and differences in size and shape you must use your day eyes. Night eyes are color blind. Colored lights look colorless to your night vision. If you see them as red green or blue, you are using your cone of day vision. Blue and green are easiest to see with night eyes. Red and orange which seem so conspicuous by day are hardest to see by night. Your night eyes and day eyes happen to be equally sensitive to red light, but for blue light your night vision is 1000 times more sensitive than is your day vision. (Science Supplement 95, 8, May 15, 1942, A.J.P.)

LIMITS OF HUMAN VISION — Abstract

Light so feeble that it cannot be measured by the most delicate optical instruments can be perceived readily by the human eye, experiments at Columbia University show. The human eye, it was found, can perceive light if it falls on as few as five molecules of the receiving substance of the retina. (Scientific American 98, 120, March 1942. A. J. P.)

RED TONES SHARPEN CERTAIN HUMAN REACTIONS — Abstract

Some human reactions are greatly sharpened under the influence of red light, according to research findings which conclude that the efficiency of the body seems to be affected by color. The average person will tend to judge weights as heavier under a red light, it is said, while blue and green lights have the opposite effect. A red light seems to make time pass slowly to the average person while under green and blue lights, time is underestimated. The conclusion is that color hues seem best for working conditions. (Whitcombings, 7, 10, Feb. 1942. A.J.P.)

MAN AND THE WHOLE — Book Notice

science

Inasmuch as no departmentalized/can, by itself, give a true picture of human beings, there is a need for a new science of man centered around the personality as a whole. This concept of "holism" has certain theoretical consequences which point to new fields of research. The holistic orientation is primarily useful in studies of function. In fact the science of personality becomes largely the dynamics of a "biosphere" (individual-environment unit) which includes all processes affected by the "autonomous" (self-regulated) forces of one person. Autonomous forces are strongest at one pole, and "heteronomous" (environmentally regulated) ones at the other. The "tensions" (dynamic relationships between autonomous and heteronomous forces) are organized into systems and are the basic units of biospheric dynamics. The general tendency of the personality is toward the increase of autonomy at the expense of heteronomy, $(a/h)_1 \longleftrightarrow (a/h)_2$, but this is balanced by a tendency toward "homonomy" (regulation by a social group). These general tendencies of the organism are expressed also in its psychological (symbolic)

functions. The study of personality is biological, in the largest sense. In its general orientation this study carries on a work, the foundations of which was laid down by theoretical biologists such as Ritter, Woodger, Haldane, A. Meyer, Bertalanffly, Uexküll, etc., by exponents of the theory of emergent evolution and by Gestalt psychologists. The book should be useful to biologists because of its unprejudiced attempts to reconcile apparently conflicting concepts in different sciences. (J. P. Scott, reviewing a book by Andras Angyal, of the Worcester State Hospital, Worcester, Mass., Foundations for a Science of Personality. xii + 398 p. Commonwealth Fund: N.Y., 1941. pr. $2.25, in Biological Abstracts, April, 1942).

MERCURY AND FATIGUE — Light on Parkinson's Disease

The author has observed about 40 cases of neurasthenia over a long period of time -- 10 years or more -- and he is convinced that the illness is caused by mercury and that there is no neurosis or malingering. The chief symptoms of mercurial neurasthenia are great fatigue, great muscular weakness, especially in the legs, frequently enervation, but first of all great irritability, which may develop to the point of maniacal attacks. Sometimes there is intolerence to alcohol. The erethism described by Kussmaul, as well as mercurial tremor, are often seen. Some cases of Parkinsonism with extrapyramidal symptoms (disturbance of sleep and potency) are also to be seen; weakness of memory and disturbances of the intelligence are rare. Depots of mercury may be mobilized by other poisoning (nitrous fumes) or by infection (fly), in which case mercury reappears in the urine. (L. Teleky, in Journal of Industrial Hygiene and Toxicology, January, 1942, Abstracts p. 5-6, reviewing the works of H. Steck, reported in Rev. Med. de la Suisse rom., vol. 60, pp. 649-655, 1940. G.B.)

WHAT IS MIND ? — Emotions and the Viscera

The paradox that emotions cause visceral disorders, although there is an unwillingness to acknowledge their physical effects, and the effect of present-day civilization on the physiology of the emotions are discussed. The most important factor in the diagnosis and treatment of unsettled cases is a willingness to think of the possibility of emotional factors at work. (C. E. Henry in Psychol. Absts., discussing an article by T. A. Walters, on the emotional factor in disease, in Dis. Nerv. System 1: 259, 287-288, 1944. G.T.)

MAN AND THE METALS — Zinc Essential to Diet

Zinc is now being added to the many metals and minerals found essential for human nutrition. Dr. E. L. Hove, of the Pillsbury Flour Mills Research Laboratories, has informed the American Chemical Society that many persons undoubtedly suffer from a zinc deficiency but the condition has not been detected because its effects are so similar to those of some of the vitamin deficiencies. Laboratory animals fail to grow and even die when deprived of zinc in their food. Meat is the principal source of the metal, with grains next, in human diets. Sugar and fats are entirely lacking in it. One of the effects of a lack of zinc is an increase of uric acid in the blood, and gout is among the diseases that can result. (New York Herald Tribune, May 31, 1942)

POLYNESIA, A New Domain for MAIN CURRENTS — Journal Notice

An altogether new world opened to jaded reality with the sudden prominence in the everyday headlines of all that vast area we are fond of calling "down under" -- otherwise Polynesia. This term is "intended to include Australasia, New Zealand, Melanesia, Micronesia and Malaysia, as well as Polynesia proper," according to the Polynesian Society. The fine Quarterly Journal of this Society is one of the more recent exchange periodicals in which we rejoice -- the most authoritative material about this part of the world, untainted by prejudiced interpretations. For the Polynesian Society promotes the study of this very ancient new world in the fields of Anthropology, Ethnology, Philology, History and the Antiquities of the Polynesian race through direct research and by the collection of books, manuscripts, photographs, relics and all other matter illustrating its history.

One cannot fail to be impressed by the significance of this sharp advance into our modern world of something so different as this great Polynesian culture brings, when offered in its purity and undistorted by the missionary-superiority which obscures understanding. The September, 1941, issue of the Journal includes, for example, an article regarding dyed and decorative cloth and wood carving rich in inspiration to artist and designer; the majestic tale of a great warrior's dying charge to his chieftains that is epic in character; the native narrative-history of one of the great tribal houses that dates back almost six hundred years at least, which would delight a dramatist; a scholarly study of the elusive Hawaiian veneration of Io and Uli, the hawk and the owl, representing in certain families and rituals at least, Supreme Being; and concludes with a Memoir Supplement on Fiji Plants, Their Names and Uses, which gardeners and horticulturists the world over must prize.

In the volume under notice (1941) the most important article from a philosophical point of view is that by Dr. E. S. Craighill Handy, The Hawaiian Cult of Io, which brings up in connection with verneration for the hawk, the whole question of a widespread pre-Aryan culture. As this is one of the greatest issues in anthropology we shall return to Dr. Craighill Handy's provocative paper when an editorial summary on the pre-Aryan culture question becomes possible. G. T.

EUGENICS AND THE CALENDAR — Mind as a Function of Temperature

Height, weight and menarchial data from over 45,000 freshmen matriculating in 4 state universities showed that season of conception plays an important part in an individual's later development. Likelihood of college matriculation rises above the normal expectancy for those individuals conceived in the winter months (Jan., Feb., March) and is low with conceptions in summer warmth. The menses of girls begin significantly earlier with conception in the winter months. However height and weight of college freshmen, both male and female, are greater in those conceived during the warmer half-year (May to Oct.) than with those conceived in winter cold. (Nov. to Apr.). These findings are thought to have a very direct bearing on human eugenics. Since present-day civilization is dominated more by mental achievement than by physical size, it is suggested that the wise parent give his future offspring the advantage of being conceived during the season which will provide greatest mental vigor in later life. Even the best heredity background may be made much more effective if supported by proper season of conception. (C. A. Mills, of the University of Cincinnati, abstracting his own article on mental and physical development as influenced by season of conception, in Human Biol. 13 (3): 378-389, 1941).

Readers are urged to send a dollar to the Commission to Study the Organization of Peace, 8 West 40th Street, New York City, to obtain regularly the reprints, from International Conciliation, of the Commission's Reports. The second of these, dealing with The Transitional Period, has just been issued. The first was The Preliminary Report. The next work of the Commission will be a study of the possibilities of the United Nations. Studies are in progress for a report upon "the difficult field of economic reconstruction." The present little volume is prefaced by a statement signed by James T. Shotwell, Chairman, and others, discussing the items which must be part of the settlement: famine, civil disorder, economic collapse, uprooted peoples, derelict colonies, social insecurity, and false indoctrination. From this list an idea is obtainable of the wide and thorough nature of the Commission's inquiry.

The papers upon specific topics are all forthright and fairly free from bookishness. A few phrases from a representative contribution entitled Social Security in the United States in the Postwar Period, by Smith Simpson, provides a specimen of quality: "World markets for the goods and services of the United States will not easily be found again. If they are found, the intelligent and thoughtful collaboration of the American people with other peoples must be forthcoming. To think of returning to the kind of catch-as-catch-can competition in trade and financing which existed in the postwar era of the early 1920's is fantastic. It will be impossible not only because it would prevent the achievement of that economic rebound which will be needed to provide the greater number of wage-earning Americans with any degree of social security except as the bounty of a Santa Claus State, but also because the ruin and chaos at the end of this war will be so much greater than at the end of the last war."

Among the papers under current notice none is more important than that of Walter M. Kotschnig, Problems of Education After the War -- Part I, In the United States; Part II, In Occupied Countries. The question raised concerns the teaching of human relations, but the analysis has wider implications. Three schools of education are identified: the teacher of objective facts; the instrumentalist who emphasizes the gaining of skill to solve problems, as when progressive schools attempt to create the atmosphere of a country being studied, using posters and the like; idealistic (or any other) indoctrinators. The author demands an education as regards human relations which will provide a concept of the world as a whole, no less.

This is a searching paper yet we presume to add one suggestion. It arises from the fact that education is not universal and that in some countries humanity must be dealt with in terms of cultural traditions. Frequently these traditions, looked at from without, appear to us to be generally inferior to our own because in some particulars they undoubtedly are. Illiterates are found in all countries, and probably well over half the population of the world, perhaps nearer two thirds, are in this state. Literacy does not mean that a person is more intelligent, necessarily, though his mind may be quickened and more reachable. In illiterate groups very high moral and other standards are often found. Now these people are to be part of the world unification that is at hand. How are they to be reached ? We suggest that the values common to all cultures, especially to all great religions be emphasized in world educational programs. Among Polynesian peoples, among American Indians, among millions in India, for instance, the idea that a person gets what he deserves, that as he has sown so does he reap, is---or was until western industrialism intervened---a universal idea. This made for responsibility, dignity and the like. An education which starts with Aristotle and some glimpses of Chaldea and Egypt, and a nod toward Farther Asia will never do for the world to come. The first step toward a world-wide educational standard is the establishment of a bare minimum of cultural norms, drawn from sources which are widely respected and thus

will have influence upon many peoples, first because their cultural pattern approves and supports the ethical standards involved, and second because these standards are now seen to be part of a world-wide will to unity. No doubt this will mean the surrender of superficial layers and vanities in every nation, and such gestures may come hardest of all from the Western peoples. But perhaps the horrors of these world wars, which we have made possible by our ungoverned science and unchecked greeds, may make us willing to assent that we have been very much the villain in the piece ? G. L.

THE MAKING OF TOMORROW — Book Review

The author of The Making of Tomorrow, Raoul de Roussy de Sales, puts this sentence of Abraham Lincoln's on the free leaf of his entrancing book: "If we could first know where we are and whither we are tending, we could better judge what to do and how to do it." M. de Sales then proceeds to offer us the most urbane and yet stirring analysis of our present position and what it reveals of the next stage. The book is charged with forthrightness, and sparkles with fresh images thrown off from that vigorous virtue. Here is one, page 27: "There has also developed in recent years a social internationalism, which could be called the Internationale of Cafe Society. It is closely linked with the internationalism of wealth although its methods of operation are quite different. They are a caricature of those of the French salons of the eighteenth century where the influence of ambitious and clever women exerted itself on an equal footing with that of clever and ambitious men. The difference between the salons of the eighteenth century and those of today is that, whereas the former were dedicated to enlightenment and inspired by a spirit of philosophical and political adventure, the latter cultivate nostalgia for the past, obtuseness, and ignorance, and if they have any inspiration at all, it is hard to say it has any other name than fear." Another, page 83: "Modern nationalism is the final product of intellectual and moral nihilism."

The book is not only frank and shrewd. It is also comprehensive, as the contents show. Nationalism: A modern Imperative; Diversity of National Concepts; Nationalism as a Force of Destruction. The Trend Toward Collectivism: Collectivism and Total War; The Conflict between Capitalism and Democracy; The Conflict between Socialism and Democracy, The Opposition to War: "Why Fight ?" & The Guilt Complex. The Folklore of Democracy: Democracy, an American Point of View. Germany and the World: The German Revolt. America and the World: America and the "Grand Proportions of History" The Road Before Us. H. M.

THE MAKING OF TOMORROW, Raoul de Roussy de Sales, Reynal and Hitchcock, New York, 1942, 338 pages.

TABLOID HISTORY OF THE INDIA NATIONALIST MOVEMENT — Editorial Survey

Until 1884 Hindus and Buddhists, even in their own lands, were despised as idolatrous, effete and superstitious. Their philosophy and psychology were little known, and what was available to European scholars had to compete with crass materialism. We must remember that there was then no Freudian psychology, no strong Society for Psychical Research -- it had just begun its work -- and the physical sciences and evolution were blatantly materialistic. The alienation of Christianity by science made that religion even more aggressive in the Orient as it lost ground in the Occident.

Late that year occurred the third annual meeting in Adyar, a suburb of Madras, of a Society which had been founded in New York City nine years before, and had been established in south India in 1882 for the express purpose of studying com-

parative religion in a fair and impartial way. This group, the Theosophical Society, was still small at that time and the gathering consisted of only a few men, mostly Hindus. The latter were so impressed by the hope of making room in the thoughts of the west for their own concepts thay they resolved to take political action pari passu with the growth of the Society, which is entirely non-political. Accordingly these men adjourned to Madras, to save the Society from being compromised or involved, and there they formed what was later to be the Indian National Congress.

Until 1905 the Congress asked only for small enlargements of liberty, more places in the civil service and higher ranking in it, such as judgeships and the like. Meantime the tide of higher appreciation of their own philosophy was also rising among Indians, and Nationalism went on as a religious and a political phenomenon, side by side, with mutual benefit in each field. But gains were slow and no one spoke in those days of self-government at the annual meetings of the Congress at Christmas time.

But in 1905 a new impulse was felt. An attempt to partition the Province of Bengal raised a great storm of protest, and in the excitement (which reached a peak in 1909, the Minto-Morley reforms) a new and more radical note was sounded in the politics of India. Indeed many of the less patient leaders, such as Bal Gangadur Tilak, left the Congress; and he and others were imprisoned for what were in fact merely political offenses. The division weakened the Congress, yet the stirring was beneficial in many ways.

This divided situation went on until 1912, 1913 and 1914. During those years the then International President of the Theosophical Society entered Indian political life, not as the Society's president but individually and personally. She was an adept at both writing and speaking, the colleague of Charles Bradlaugh and Bernard Shaw -- the celebrated Annie Besant, who founded the first labor union of London women, to save makers of matches in England from the horrible death consequent upon "phossy jaw."

Since her arrival in India in 1893, Mrs. Besant had worked successively at religious, educational and social revival in India, but she had found at every step that political liberty was imperative before India could make its way to its proper place in the world. She now interceded in this divided situation in the political ranks and, daring the odium put upon her by the conservatives, she brough Tilak and others back into the Congress. This she accomplished by first forming a separate Home Rule League which later merged with a parallel organization of Tilak's; then by getting the blessing of the older political figures, such as Dadabhai Naoroji and many courageous contemporary men, upon demands for self-government.

Meantime, in 1914 came World War I. Mrs. Besant had previously bought a daily newspaper, the MADRAS STANDARD, and renamed it NEW INDIA. With this instrument and her fame and golden eloquence she wrought India's political feelings to a high pitch. She took literally the public declarations of Britain that this war was for self-determination of all peoples, until at last the Government could endure this sort of thing no longer, and interned her as a political prisoner.

She was confined at Ootacamund in June, 1917. The country raged with excitement. A little over three months later, Mrs. Besant was not only released by reason of the political pressure bought to bear on the Government in India and upon parliament in London, but his Majesty the King-Emperor sent out the then Secretary of State for India, Mr. Montagu, to confer with the Viceroy and to make the announcement that the goal of government in India was swaraj (self-government). Mrs. Besant was released for this event, and the grateful Congress made her its President in Calcutta, in 1917, the first woman to hold this office of high esteem. Her address on this occasion was a masterly summary of the situation.

The outcome of this was the preparation of a Bill to initiate the self-government process, and this Bill was actually passed in 1919. Mrs. Besant was returning from England and on the high seas, bearing with her an advance copy of this Bill when General Dyer murdered about 500 helpless, unarmed men, women and children in the Jalianwallah Bagh at Amritsar. Out of the fury of the people over this, Mr. Gandhi came into power.

Mr. Gandhi is a man of peace, but the uniting of a small number of Indians in South Africa against a very much larger number of Cape peoples, to gain political rights, was a very different thing from uniting millions of Indians against a few Europeans. This meant violence, because the movement was born in violence and rightful enough indignation.

It would have resulted in many more deaths than it did at first had not some leaders, Mrs. Besant included, appealed to the country. They were very unpopular for a long time, but this tempering of the non-cooperation movement prevented widespread disorder and a long succession of veritable French-revolution and counter-revolution events. In the end Mr. Gandhi converted his movement to something with social meaning, admitting in his own words that his first policy had been a "Himalayan blunder."

Younger men, like Krishnalal Shridharani, author of MY INDIA, MY AMERICA, know very little of all this and are ardent Gandhi disciples. Hence the disproportion in his references to pertinent items, and hence doubtless also the ill-informed remark in Louis Bromfield's preface introducing that book to the public.

Mr. Gandhi's great role has been to bring a vague notion of the Home Rule idea down to the villages, and to give Indians a new sense of social obligation. He has also dominated the Congress from time to time. But on his left and his right are a number of able men like Jawaharlal Nehru, Sir Tej Bahadur Sapru, C. Rajagopalacharier and others who will come into power when the political machine has to be worked.

The self-government concessions of 1919 were to be revised ten years after, but the excitement attendant on the Dyer outrage and the non-cooperation movement put this off until 1935, when very much larger instalments of freedom were given. Still the main demands were withheld however, namely, power over the purse; power over police and military; the inalienable rights of the legislature against the executive, and some other lesser matters.

Events are bringing about what no amount of argument had yet achieved. India's freedom is quite certain. Nothing remains really but for her leaders to define in exact terms what they want, as united peoples; and to put these demands to the Indian nation, and to the world.

The principal present problem, Hindu-Muslim unity, is a dangerously aggravate result of a fatal mistake in policy by the authorities in the days of Minto's viceroyalty. This was when Morley was Secretary of State for India. In response to an appeal from a deputation of Muslims the principle of introducing religous affiliations into electoral procedures was adopted, and this precedent has been effective in influencing policy ever since. Neither in Britain itself nor in the United States does this mixture of religion with democratic political machinery have any standing whatever. It may be that the British Raj finds the precedent awkward today. But it cannot abandon its responsibilities. There is in fact no way out of the present impasse unless a compound miracle happens under the pressure of military necessity. Just as this war is forcing us in the United States to reform our relations among Gentiles and Jews, between Negroes and Whites, so it may be that the war will somehow bring about that situation in India which will not only unite her leaders effectively, but also bring the Government of India to establish a standard for democratic procedure under Dominion Status which will throw out religious differences as a criterion in electoral procedure, will make way for the people of the Indian States to act democratically along with the population of British India, and salvage the painfully acquired political unification of India, which is one of Britain's causes for satisfaction over her rule. The war has wrought some miracles, changed relations between Russia and the other democracies being one of them. We may therefore reasonably hope that other gains lurk under the shadows of the clouds that are massed over us, a free and united India among them. F.K.

THE CALL FOR INTEGRATION — A New Journal

The American Association for the Advancement of Science has started, in March of this year, a Bulletin with which to communicate with its 24,000 members, not all of whom take either Science(weekly) or The Scientific Monthly, the two other official A.A.A.S. publication. We herewith add it to our source list. It is large - by a news vehicle, but in the second issue a correspondent (merely described as R. A., Iowa) wrote these significant words:- "With the ever-increasing specialization on the part of the individual, and ever-increasing centralization of power in the hands of large institutions and Federal Government, it is difficult for the individual to know about the various branches of science. Even more difficult is it to integra te this knowledge in the various branches of science, as well as science with the current thought in religious fields. My suggestion is that some thought and consideration be given this problem of integration of the various branches of science and of science with religion. This integrated knowledge should be made available, not only to the members of the Association, but to the general public also. I realize that this is easier said than done, but it also appears to me that the mass of unrelated and isolated details could be cleared by some organization such as the Association which is made up of the various branches of science."

THE SUN'S TEMPERATURE — A Solar Cycle

Data compiled by Smithsonian Institute observers in many parts of the world indicate that the sun will be at its lowest ebb, thermally speaking, in 1945. After that our planetary system's central furnace will begin to warm up again. Study of data from thousands of accurate readings of solar heat, taken daily in observatories in Chile, the Sinai wilderness and the Mojave Desert, which has been published in Vol. 6 of the Annals of Astrophysical Observatory of the Smithsonian Inst., has shown that there are 14 distinguishable intensity cycles in the sun's radiation. Some are of brief duration, others require years for the swing from high to low. Once every 23 years, all the lows come together and that combination low point is due in 1945. There is little direct relation between solar radiation and sun spots. However the latter gives off streams of electrically charged particles, which entering the earth's atmosphere serve as neuclei for the condensation of water vapor in the upper atmosphere, and thus lead to the increase in cloudiness and of rainfall which may be entirely independent of heat effects.
(Science Supplement 95, 10, May 22, 1942. A. J. P.)

SOLAR MAGNETISM — An Organic System

Close relations between events on the sun and conditions on earth, due in part to the magnetic nature of both great globes, were traced in the Arthur Lecture delivered at the Smithsonian Inst. by Dr. John A. Fleming, director of the Dept. of Terrestrial Magnetism, of the Carnegie Inst. The sun, Dr. Fleming pointed out, is a vast spherical magnet with a magnetic field force about 100 times as intense as the earth's. The magnetic poles, like those of earth, are not located exactly on the rotational poles. The sun's magnetism does not directly affect the magnetic field of the earth and the great magnetic storms are not related to electrical or other visible or audible disturbances in the earth's atmosphere. They are utterly silent and imperceptible and make themselves evident mainly through their disruptive effects on wired and wireless communications. (Science Supplement 95, 10, Mar. 6, 1942. A.J.P.)